

**TESTIMONY BEFORE THE ENERGY AND ENVIRONMENT
SUBCOMMITTEE OF THE U.S. HOUSE SCIENCE AND
TECHNOLOGY COMMITTEE**

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Congressman Baird and members of the subcommittee, I am David Sjoding, Renewable Energy Specialist with the Washington State University Extension Energy Program. I lead the six state Pacific Regional Biomass Energy Partnership (a group of six states that have worked as a team since 1983) <http://pacificbiomass.org/>. The states include Alaska, Hawaii, Idaho, Montana, Oregon and Washington. I also lead the five-state Northwest Clean Heat and Power Application Center <http://www.chpcenternw.org/>. Both groups and green economy developers have significant informational needs on biomass feedstock supply and assessments.

The Committee asked me to consider the following guidelines for my testimony:

- Provide a brief overview of the Washington State report *Biomass Inventory and Bioenergy Assessment*. Focus your discussion on the forest biomass available or not available in the state.
- Describe the reports assessment verses other major assessments on biomass, for example the Western Governor' Association study. What are the differences among the different reports and why is it important to have consistent biomass data across the western region.
- Why did the state feel the need to commission this report? To the best of your knowledge how has Washington State used this information?

Context

Developing accurate biomass inventories and assessments has been a difficult challenge since the late 1970s when Congress first asked the key question: How much biomass is available? It is meticulously detailed work with a very wide range of feedstocks. The feedstock diversity of the Pacific region, for example, ranges from tropical to boreal forest. The assignment to begin development of a good database was given to Oakridge National Laboratory. They started in the southeastern states and worked westward to the Mississippi River. Funding and interest faded in the 1990s. As a nation, we have cycled several times through periods of sharp focus on bioenergy/biofuels and lesser interest. The bioenergy analytical base gets stronger with each cycle.

Overview of the Washington Biomass Inventory and Bioenergy Assessment

This December 2005 report covers 44 feedstocks. The report found that the total biomass that can be sustainably harvested is 16.9 million dry tons. The number of feed stocks is indicative of the biomass diversity encountered in many states. The data is at the county level. A drop down menu (feedstock by county) is found at <http://www.pacificbiomass.org/WABiomassInventory.aspx> . The full report is found at http://pacificbiomass.org/documents/WA_BioenergyInventoryAndAssessment_200512.pdf . This report has a strong sustainability focus to ensure only appropriate amounts of biomass are removed from the land and to guard against overharvesting assumptions being embedded in the analysis. A targeted stakeholder group was engaged to ensure data quality, data access and provide guidance. The report is currently receiving an update (better data for forest thinnings and wheat straw). The updated report when complete will increase the 16.9 million dry ton amount to 19.6 million dry tons (an increase of 16 percent). A key companion report focused on the unique chemical characteristics of each feedstock. It is found at <http://www.ecy.wa.gov/pubs/0707025.pdf>. A third report on transportation economics is being prepared by Washington State University. Forestry is the toughest area to obtain good data. The range of additional sustainable forest biomass estimates from the University of Washington would add 3 million to 10 million dry tons to the 2005 report. Bioenergy crops would further increase inventory amounts.

Two other states in the Pacific region also have developed their own state-wide biomass inventories – Hawaii in 2002 and also being updated <http://pacificbiomass.org/documents/HawaiiBiomassAssessment.pdf> and Alaska as part of its Renewable Energy Atlas in 2007

<http://www.aidea.org/aea/Reports%20and%20Presentations/EnergyAtlas2007.pdf> . Alaska is also implementing a GIS system with its Atlas.

Comparison to National/Regional Assessments

There are a number of differences between state assessments and broader national and regional assessments. These differences pre-date and include the ORNL Billion Ton report

<http://www.bcsmain.com/mlists/files/btvision.pdf> and the Western Governors Association's Biomass Resource Assessment and Supply Analysis for the WGA Region

<http://www.westgov.org/wga/initiatives/transfuels/Task%201.pdf> . It is noted that like the states of Washington and Hawaii, the Billion Ton report is also being updated to a second edition. Both the state and national/regional approaches have their strengths/differences:

State strengths include:

- 1) Greater detail from a broader number of specific feedstocks at the county level;
- 2) An ability to specifically ground truth for accuracy to prevent over or under counting;
- 3) An ability to ensure only sustainable amounts of biomass are included. For example, rainfall variability can have a significant impact at the county level on the amount of biomass available from specific feedstocks;
- 4) An ability to coordinate with state efforts to keep organic wastes from going to landfills (called Beyond Waste in the state of Washington <http://www.ecy.wa.gov/beyondwaste/>);
- 5) An ability to encourage bioenergy economic development projects with strong resource data;
- 6) An ability to identify growing competition for the same feedstock (an early warning system); and
- 7) Provision of a database for both policy level and project level analysis.

National and regional strengths include:

- 1) A consistent database and GIS format available on a national/regional basis;
- 2) An ability to highlight the nations bioenergy potential;
- 3) An ability to identify regional transmission lines and renewable energy zones to move power across the West; and
- 4) An ability to identify feedstock supply opportunities that extend across state boundary lines.

Differences in report content focus on under counting the available biomass at the state level. Washington was under counted in the Billion Ton report by approximately 70 percent. This under counting is focused primarily in the forest portion of the assessment. A number of other states are in similar circumstances. Good forest database information is often not available – both at the national and at the state level. Light Detection and Ranging (LiDAR) data with analysis would significantly solve the database problem. It is expensive (\$400-500 per square mile with additional funding for analysis). It is beyond the financial capability of most states. Washington has nibbled at LiDAR (approximately 15 percent of the state is done, mostly in urban areas). With exclusion of steep slopes (15 percent) another 70 percent of the state would cost approximately \$21 million. We believe LiDAR will also help us with healthy forest initiatives.

The second edition of the Billion Ton report appears to be moving in the direction of improved forest data. Oregon State University (OSU) is supporting the second edition with improved multi-state forestry data. OSU has shared this data with WSU. It will be included in our updated inventory.

Why did Washington do a biomass inventory and assessment? What are its uses?

The Washington biomass inventory and assessment was undertaken for a variety of reasons:

- 1) Washington produces over 300 agricultural crops with a resulting wide range of feedstocks;
- 2) A very strong judgment was reached in 2002 that the Western states were being under counted by ORNL analysis;
- 3) A need to broadly identify the bioenergy renewable resource from an inclusive perspective (biofuels, biopower & bioproducts);
- 4) In 2002, our Department of Ecology completed a major overhaul of its solid waste management strategic thinking. This broad stakeholder process resulted in the Beyond Waste strategy of keeping all organics and recyclables out of our landfills. Shifting organic waste streams to revenue producing resources is a key portion of Beyond Waste. It was the Department of Ecology, looking at the potential environmental benefits, that provided the funding for the report;
- 5) Improved energy policy analysis; and
- 6) Improved support for bioenergy economic development projects.

The report had a wide variety of uses:

- 1) A broad consensus developed in state government (executive and legislative branches) to develop our bioenergy resources. \$31.8 million was appropriated in the 07-09 biennial budget for projects (Energy Freedom Fund), state focused bioenergy research, and technical/outreach staff;
- 2) The voters passed a renewable and energy efficiency portfolio standard (Initiative-937) with the report as one of the underpinning analytical pieces;
- 3) Support for bioenergy project developers. They get an excellent starting point for their normal due diligence;
- 4) Identification of research targets. It helps to have a good feedstock shopping list. Our \$5 million in northern climate anaerobic digestion, especially co-digestion with food processor waste is an example; and
- 5) A sharper focus on organic waste streams and their locations for targeted action.

Concluding comments

I have two concluding comments:

- 1) We are very pleased with improved cooperation with the national inventories and assessments. We look forward to the second edition of the Billion Ton report; and
- 2) We would appreciate broad national support for better public access LiDAR data for our forest resources